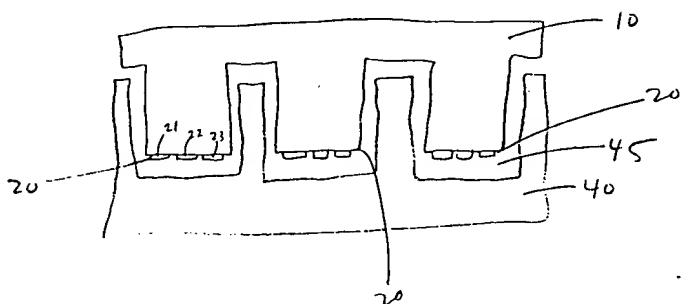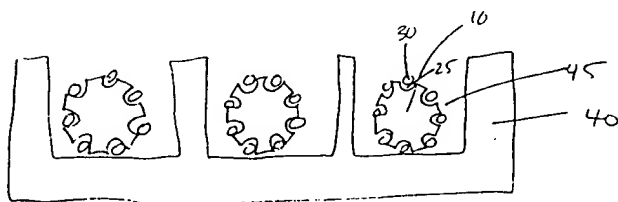Fig 1A

Fig 1B

Fig 1C

Fig 1
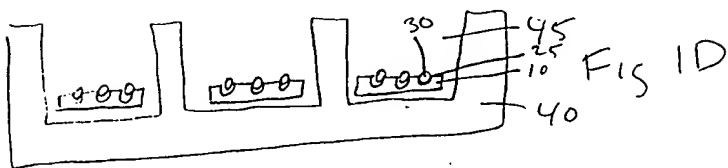
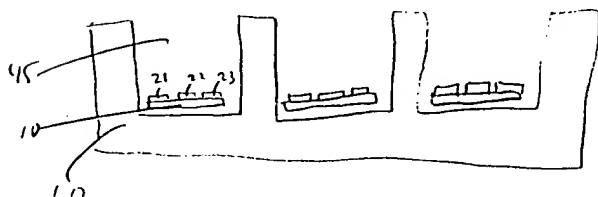Fig 1D

Fig 1E

10

70

10

71

10

72

1

70'

71'

72'

40

70'

71'

72'

40

Fig 1F

Fig 1, cont

30

50

60

45

25

45

23 22 21

50
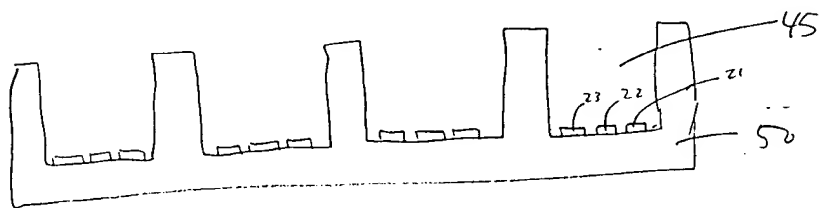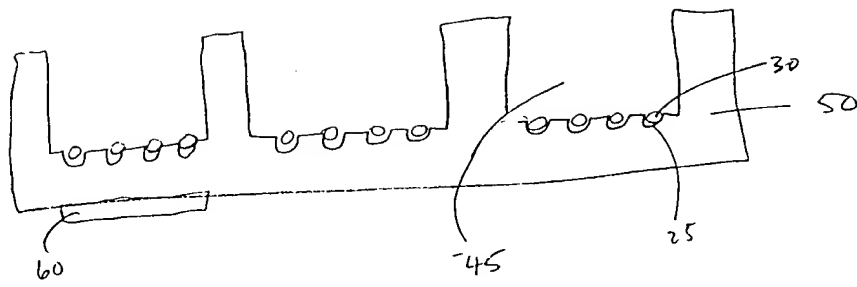
Fig 2

Figure 6

Fig 3

Decoding 16 Probes

Hyb stage # 1 2 3 4

	1	2	3	4
a	green	green	red	green
b	red	green	green	red
c	red	red	red	green

Probe Sequence

Figure 4

128 bead types
(4013 beads
total)
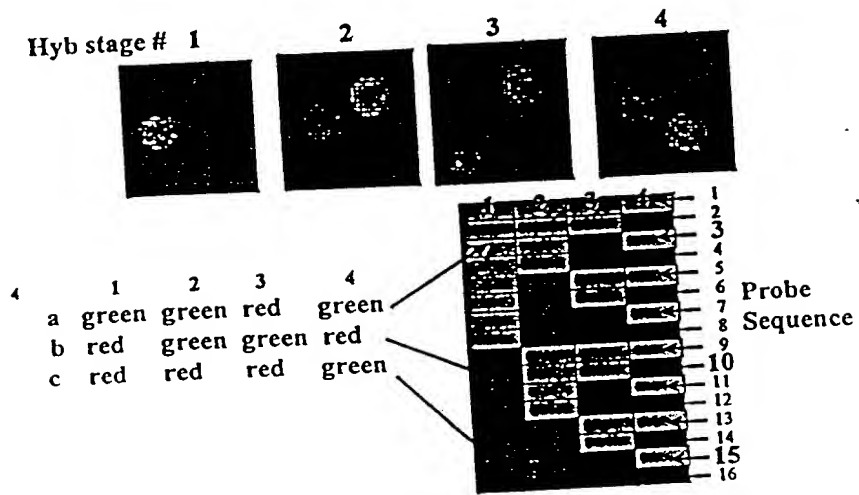
Four dyes
(Bod493,
BodR6G,
Bod564,
BodTXR)

Four Stages

Stage 1

Stage 2

Stage 3

Stage 4

Fig 5

Figure 2

GreyScale Decoding

A.

Code	S1	S2	S3
1	100	100	100
2	100	100	40
3	100	100	10
4	100	40	100
5	100	40	40
6	100	40	10
7	100	10	100
8	100	10	40
9	100	10	10
10	40	100	100
11	40	100	40
12	40	100	10
13	40	40	100
14	40	40	40
15	40	40	10
16	40	10	100
17	40	10	40
18	40	10	10
19	10	100	100
20	10	100	40
21	10	100	10
22	10	40	100
23	10	40	40
24	10	40	10
25	10	10	100
26	10	10	40
27	10	10	10
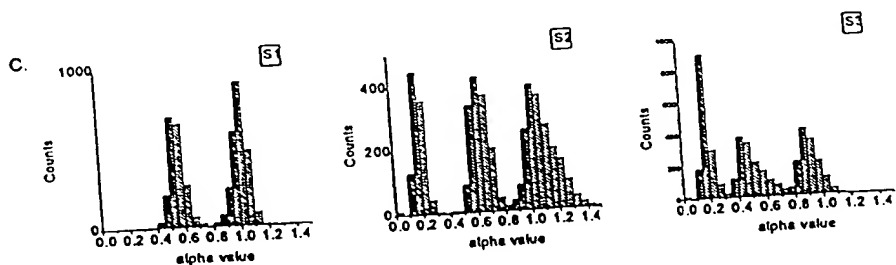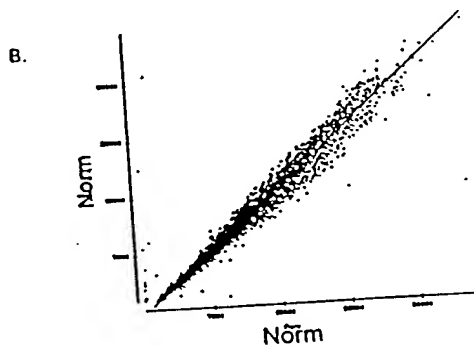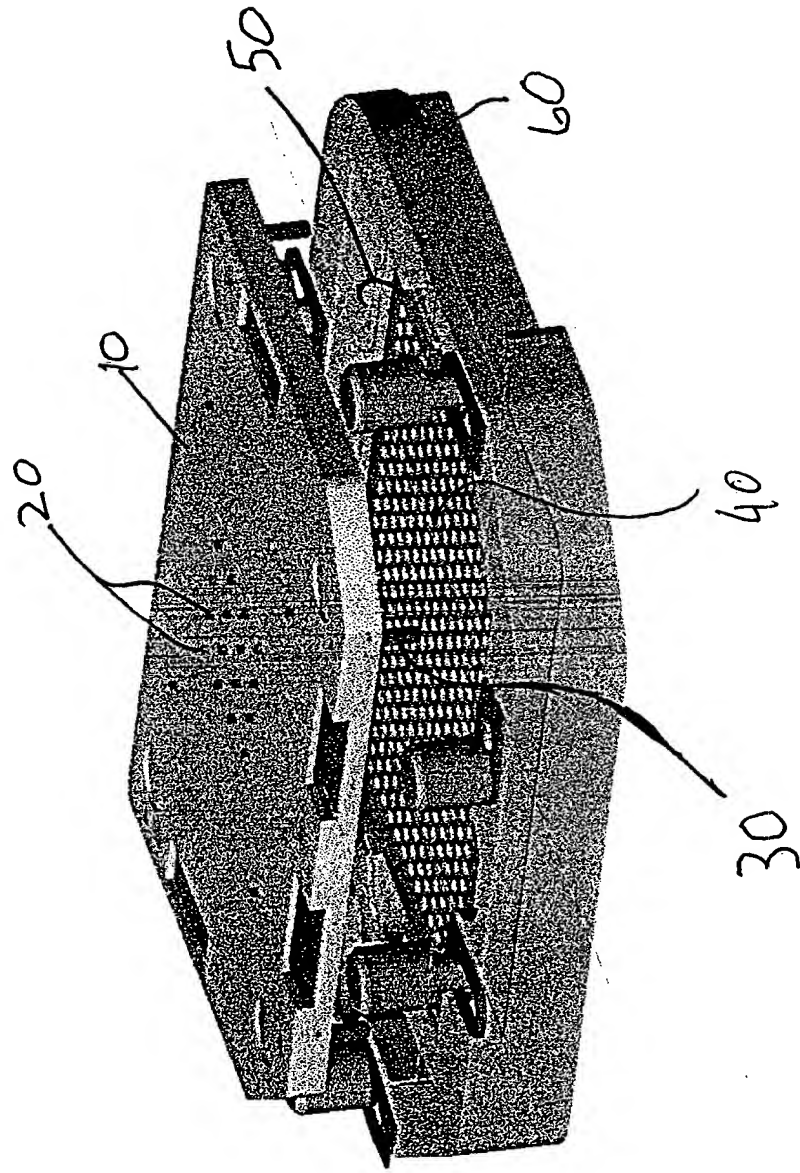
B.

C.

Figure 3

FIS 6

Figure 7A

50

6

Figure 7B

Figure 8

O'ring Seal (80)

Plug
Not Shown

Fiber Bundle
Proximal Side

Fiber Bundles 30

10

Clamp Studs
(90)

95

Base Cavity
Holding Microtiter Plate 50

Fiber Bundle Distal
Side

Microtiter Well

Microtiter Plate

Base Plate 60

SECTION F-F
SCALE 1 : 1

Figure 9A

Fig. 1 Base Block Concept, Isometric View

105

100

Figure 9b

Fig. 2 Base Block Concept, Cross Section Side View

A

Suck
Fluid

+P   +P   +P

B

Hyb Fluid   membrane

-P   +P...   +P

C

First   Second   Second
Vacuum   Vacuum   Vacuum

-P.   -P.   -P.

D

+P   -P   +P

Figure 10

E

| $-P_2$ | $-P_1$ | $-P_2$ |

F

| $+P$ | $+P$ | $-P$ |
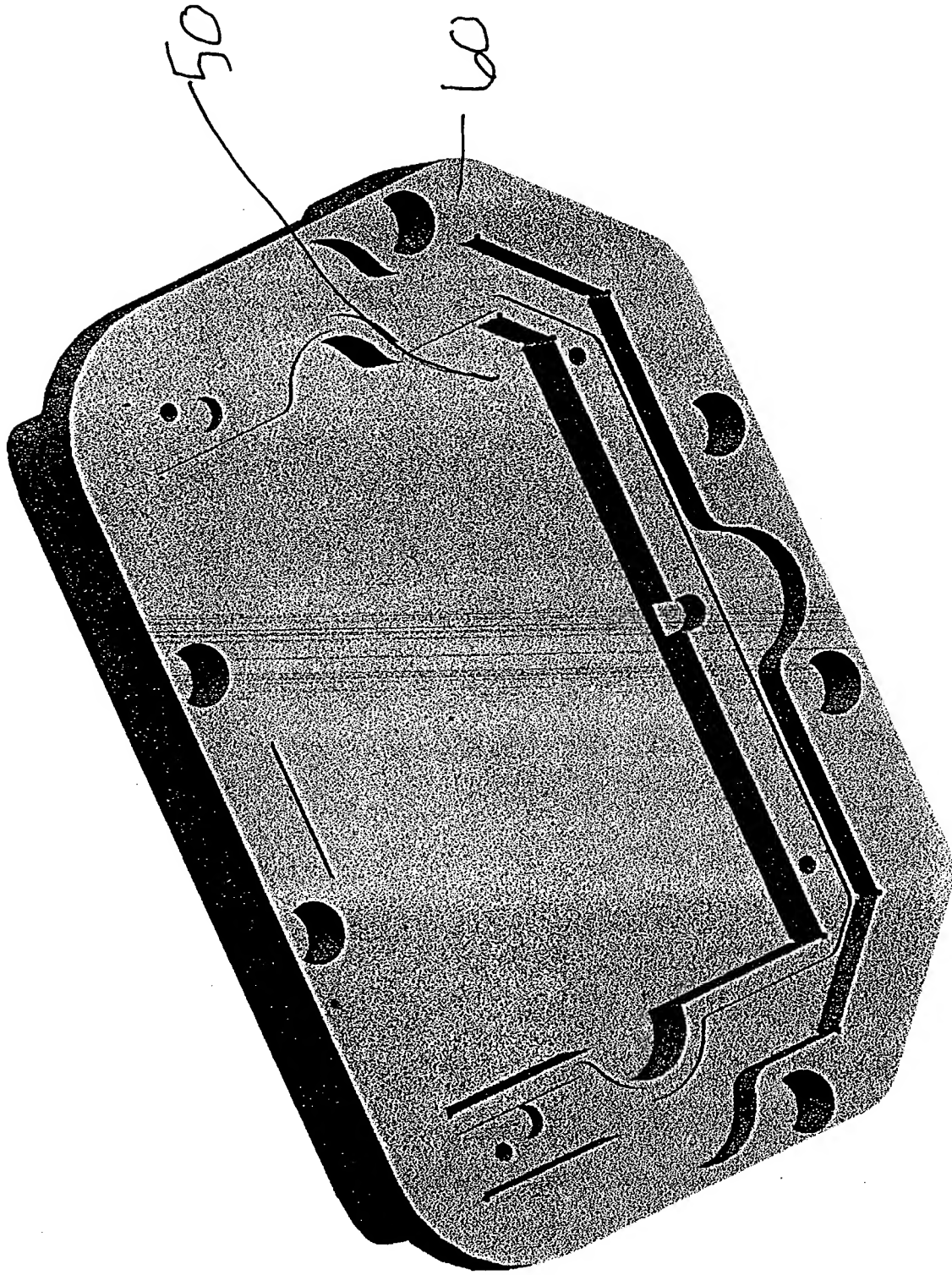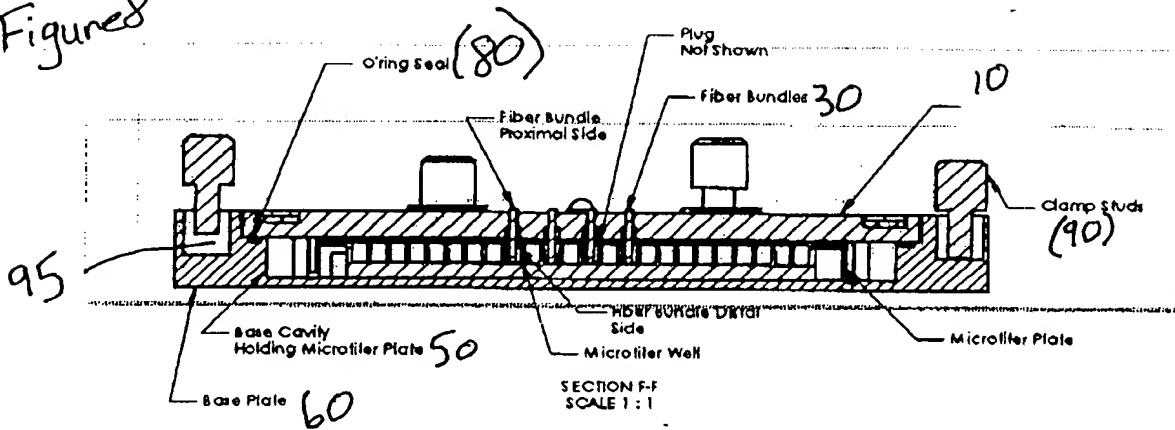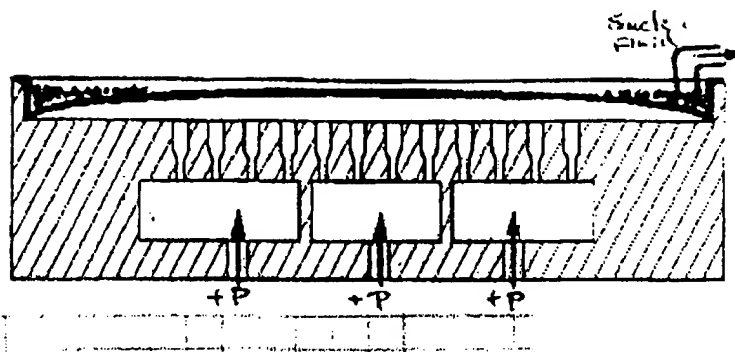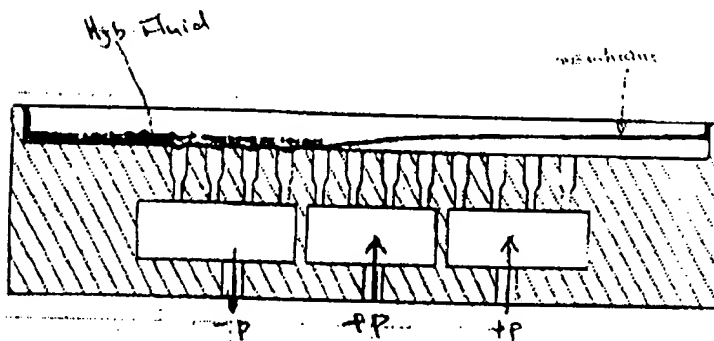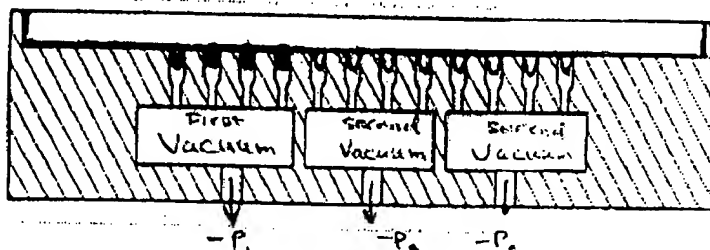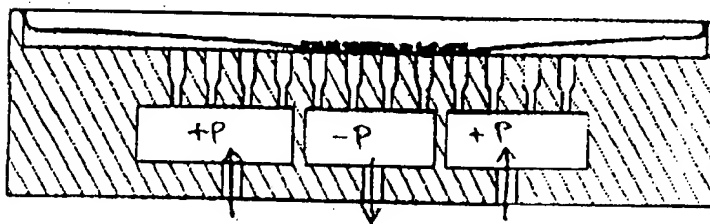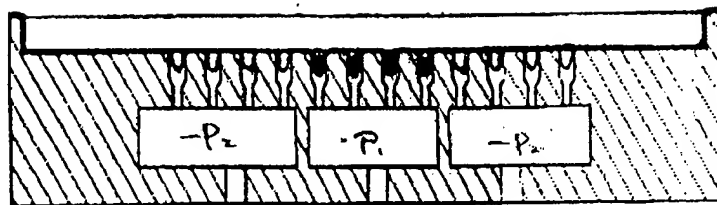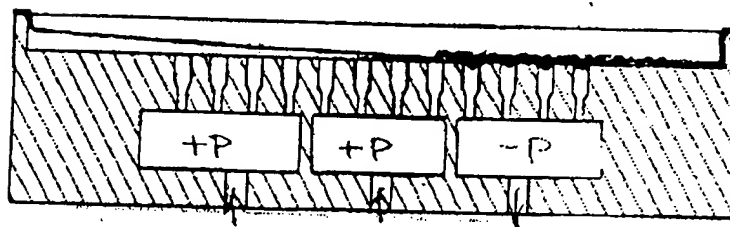
Figure 10 (cont'd)

ANALYTICAL HYBRIDIZATION

Strip Residual Signal
If necessary
NaOH

Prepare Hyb solution
OLA
SBE
PCR
RNA prep (amplification)

Prehybridization
buffer
room temp
30 min.

Transfer samples to microtiter plate
96 well
384 well
1536 well

Hybridization
temp range 37°C - 65°C
30 min. to overnight
place in hyb oven
mixing is critical

Rinse
buffer

Simple Wash
room temp
buffer

Involved Wash
50°C
buffer
mixing is critical

SAPE

Signal Amplification
SAPE, wash
antibody, wash
SAPE, wash

Wash
buffer

Decode

Image Acquisition
on microscope system
entire array
multiple channels

Storage
rinse
strip
rinse in water
dry with ethanol

Figure 11

Figure 12

Fibers inserted
into mold

enclosed mold
cavity

cavities in base for
securing fibers in
position

injection ports

holes for inserting
fibers

Figure 13